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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,918	09/18/2003	Luigi Di Dio	856063.751	6478

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EXAMINER

DANG, PHUC T

ART UNIT PAPER NUMBER

2818

DATE MAILED: 01/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/666,918

Applicant(s)

DI DIO, LUIGI

Examiner

PHUC T DANG

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on election filed 12/17/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 21-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-9 is/are allowed.
- 6) ☒ Claim(s) 10-13, 15, 16 and 21-24 is/are rejected.
- 7) ☒ Claim(s) 14 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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### **DETAILED ACTION**

#### **Election/Restrictions**

1. Applicant's election filed on December 17, 2004 has been acknowledged.

In election, Applicants elects Group I (claims 1-17) and cancels Group II (claims 18-20) and add newly claims 21-24 which is the same subject matter of the Group I.

2. Claims 1-17 and 21-24 are currently pending in the application for examination at this time.

#### **Oath/Declaration**

3. The oath/declaration filed on September 18, 2003 is acceptable.

#### **Priority**

4. Acknowledgment is made of applicant's claim for foreign priority based on an application filed on 9/18/2002. It is noted, however, that applicant has not filed a certified copy of the application No. MI2002A001985 as required by 35 U.S.C. 119(b).

Examiner has been acknowledged a receipt is acknowledged of papers No. 100 50 933.9 filed on October 13, 2000 which is not belong to the above application.

Applicants are advised to file the correct foreign priority in response to the next Office action.

#### **Specification**

5. The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

#### **Claim Objections**

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6. Claim 14 is objected to because of the informalities following:

In claim 14, lines 2, "deep UV photo-resist layer should amend to -- "deep UV" photo-resist

--.

### **Claim Rejections - 35 USC § 102**

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 10-12 and 15-16 are rejected under 35 U.S.C. 102 (b) as being anticipated by Lin et al., hereinafter "Liu" (U.S. Patent No. 6,342,448).

Regarding claims 10-12, Lin discloses a method for manufacturing electronic semiconductor devices, comprising:

depositing a hydrophobic layer which is a BARC (54, Fig. 3A) directly on a semiconductor layer (52, Fig. 3);

depositing a photo-resist layer (56, Fig. 3A) on the hydrophobic layer,

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selectively removing the photo-resist layer in order to form an opening therein and expose a portion of the hydrophobic layer (Fig. 3A);

selectively removing the hydrophobic layer (54, Fig. 3A) in correspondence with the exposed portion thereof to expose a portion of the semiconductor layer (52, Fig. 3A);

etching the substrate in correspondence with the exposed portion of the semiconductor layer (52, Fig. 3B); and

removing the layer of hydrophobic material and the photo-resist layer (56, Fig. 3B) from the unexposed portions of the semiconductor layer (52, Fig. 3B).

Regarding claims 15-16, Lin discloses a step of removing the hydrophobic layer from the exposed portion of the semiconductor layer is performed through plasma etching [col. 7, lines 63-65].

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Signorini (U.S. 2004/0041272 A1).

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Lin discloses all the features of the claimed invention as discussed above, but does not disclose the hydrophobic layer has a thickness comprised between 300 Angstroms and 1600 Angstroms.

Signorini, however, discloses the hydrophobic layer has a thickness comprised between 300 Angstroms and 1600 Angstroms [page 2 [0019]].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to apply the teaching of Signorini to Lin discussed above such that the hydrophobic layer has a thickness comprised between 300 Angstroms and 1600 Angstroms for a purpose of improving of adhering efficiently between the substrate and the hydrophobic layer.

8. Claims 21-22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Signorini (U.S. 2004/0041272 A1).

Signorini discloses a method for manufacturing an integrated device, comprising:

providing an intermediate structure, the intermediate structure including a hydrophobic layer which comprises of BARC layer (14, Fig. 2) positioned on a substrate (12, Fig. 2), and a photo-resist layer (16, Fig. 2) positioned on the BARC layer;

providing an opening (18, Fig. 2) in the photo-resist layer to expose a portion of the hydrophobic layer (14, Fig. 2); providing an opening (20, Fig. 3) in the hydrophobic layer (14, Fig. 3) corresponding to the exposed portion thereof, that exposes a portion of the semiconductor layer.

Signorini discloses all the features of the claimed invention as discussed above, but does not disclose the hydrophobic layer positioned on the semiconductor layer as in claim 21.

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However, Signorini suggests the substrate may comprise one or more layers of dielectric, conductor or semiconductor as shown on page 2 [0018]. Thus, the hydrophobic layer positioned on the substrate as shown in Fig. 2 means that the hydrophobic layer positioned on the semiconductor layer as similar to the claimed invention.

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to modify the teaching of Signorini as taught by forming the hydrophobic layer on the semiconductor layer for a purpose of improving of adhering efficiently between the substrate and the hydrophobic layer.

#### **Allowable Subject Matter**

9. Claims 1-9 would be allowed.

The following is a statement of reason for the indication of allowable subject matter:

Claims 1-9 are considered allowable since the prior art of record and the considered pertinent to the applicant's disclosure does not teach or suggest the claimed invention having a step of etching the substrate in correspondence with the exposed portion through chemical etching with a watery acid solution and removing the layer of hydrophobic material and the "deep UV" photo-resist layer from the unexposed portions of the semiconductor substrate.

Claims 14 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claim.

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None of the Prior Art made records discloses the photo-resist layer is a "deep UV" photo-resist layer as cited in claim 14 and a step of etching the substrate is performed by chemical etching with a watery acid solution as cited in claim 17.

**Conclusion**

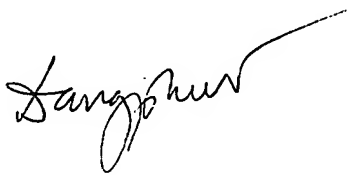
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuc T. Dang whose telephone number is (571) 272-1776. The examiner can normally be reached on 8:00 am-5:00 pm.

11. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and After Final communications.

12. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Phuc T. Dang

PD



Primary Examiner

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